Integration of Financial Markets in SAARC Countries: Evidence Based on Uncovered Interest rate Parity Hypothesis

Muhammad Arshad Khan and Muhammad Zubair Sajid

Pakistan Institute of Development Economics Islamabad Pakistan

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ABSTRACT

This paper examines interest rate linkages among four SAARC countries vis-à-vis United State using monthly data over the period 1990M1 to 2006M3. The empirical findings suggest the existence of single co-integrating vector between SAARC countries' interest rates and US interest rate. The results further suggest that except India, the coefficient restrictions for Pakistan, Sri Lanka and Bangladesh are met significantly. However, in the case of India, the coefficient associated with foreign interest rate is far from the predicted value of UIP. The adjustment coefficients indicate no two-way causality. We also implemented the co-integration test within the SAARC countries. The test results suggest the existence of one co-integrating vector. The existence of one co-integrating vector indicates the low degree of money markets integration in the region. Moreover, in the long-run except Indian interest rate, other interest rates exerted positive impact on Pak-interest rate. Short-run error-correction model is also estimated. The results suggest that Pakistani, Indian and Sri Lankan interest rates act as equilibrating factors in the long- run, while no dynamic interaction between Pak-interest rate and Bangladesh-interest rate have been seen so far.

Key Words	Financial Markets Integration, Interest Parity.
JEL Classification	F15, F36, G15

1. INTRODUCTION

Efficient and well-integrated financial markets are thought to be a crucial infrastructure that facilitates savings, investment and economic growth. An under-developed and rigidly segmented financial market works against efficient allocation of financial resources within an economy. Due to the policy rigidities and poor technical and legal infrastructure, economic agents

* Authors are Research Associate and PhD scholar Pakistan Institute of Development Economics Islamabad and Deputy Director Department of Education (Colleges), Government of Azad Jammu & Kashmir, Muzaffarabad.

tend to spend considerable resources to circumvent institutional roadblocks in search of higher profits. The integrated financial markets are also of great help to the monetary authorities in their policy making decisions. Transmission of monetary policy becomes smooth and quick only when the impact of policy intervention at one end of the market gets quickly transmitted to the entire spectrum of the market (Nag and Mitra, 1999-2000).

The degree of financial market integration has increased significantly since the early 1990s due to the increased globalization, increased worldwide investment opportunities, higher rates of returns and the opportunities of diversifying risk internationally. Many developing countries have encouraged international capital movements by dismantling barriers, deregulating domestic financial system and creating enabling environment by the introduction of market-based financial reforms. Financial liberalization policies have been adopted by most of the developing countries in order to gain efficiency in their domestic financial system through liberalizing interest rates, reducing credit controls, enhancing competition among the financial institutions and create and develop the money and capital markets. Similarly, many East Asian countries took measures to relax controls on international capital movements and adopt more flexible exchange rate arrangements. These efforts have gradually strengthened and deepened the domestic financial markets, and the integration between domestic and international capital markets has started to emerge. This increases the degree of integration by increasing private capital inflows to developing countries.

Financial openness may offer many benefits: it leads to greater opportunities for risk sharing and consumption smoothing (Chocrane, 1991; Townsend, 1994); improves capital allocation and potential for higher economic growth (Levine, 1997); equalizes rates of return of various financial instruments; cheapens access to international capital markets expands investors' opportunities for portfolio diversification; provide a potential for achieving higher risk-adjusted rates of return. It also allows countries to borrow to smooth out consumption in the face of adverse shocks, and the potential growth and welfare gains resulting from international risk sharing can be large (Obstfeld, 1994). Furthermore, financial openness may increase the depth and breadth of domestic financial markets and lead to an increase in financial intermediation process by lowering cost of transactions and excess profits associated with monopolistic markets, thereby lowering the cost of investment and improving resource allocation.

East Asian Countries have taken a number of measures to liberalize their financial system in the early 1990s. These liberalization measures are expected to enhance the efficiency and productivity of their economies and to make it internationally competitive. The financial sector reforms in these countries include, *inter alia*, partial deregulation of interest rates, reduction of cash reserve ratio (CRR) and statutory liquidity ratio (SLR), issuance of government securities at market related rates, increasing reliance on the

indirect instrument of the monetary policy such as, open market operations, development of the secondary markets, relaxing foreign exchange controls, establishment of inter-bank markets, full convertibility of domestic currency at current and capital account, liberalizing the cross-border movements of capital and foreign exchange regimes. The objectives of these reforms are to reduce market segmentation and encourage inter-linkages between the markets and reduce arbitrage opportunities. All these efforts help to enhance market efficiency and increase the effectiveness of monetary and exchange rate policies in the economy.

The financial integration greatly affects the behaviour of exchange and interest rates across countries, which in turn have crucial implications for the degree to which the domestic monetary authorities can pursue independent monetary policy. It can be argued that the more integrated financial markets the limited will be the scope for pursuing independent domestic monetary policies (Moosa and Bhatti, 1997). For example, if capital moves around to eliminate the differential between interest rates across countries, the domestic monetary authorities will have no control over interest rates relative to other countries, limiting the impact of their stabilizing policies. Therefore, it is necessary for the policy makers to take full account of the possible repercussions of international market integration[1].

Now the question is to what extent financial openness has succeeded in narrowing down the inter-market divergences and achieved a significant degree of market integration within domestic markets and between domestic and overseas markets? In this study we try to take this issue in the major SAARC countries including Pakistan, India, Bangladesh and Sri Lanka utilizing monthly data over the period 1990M1 to 2006M2.

The rest of the paper is organized as follows: Section 2 discusses the concept of financial development and its impacts on the economy, while section 3 deals with the model, methodology and data. Empirical results are discussed in section 4 and some concluding remarks are given in the final section.

2. FINANCIAL DEVELOPMENT AND ITS IMPACTS ON THE ECONOMY

The literature suggests that a well-functioning system of financial intermediation can facilitate the development of investor-friendly institutions and competitive markets. A well-developed financial sector performs the following critical functions:

- It promotes overall savings by providing alternative investment instruments;

[1] Ibid, p. 52.

- It allocates financial resources optimally among the different sectors of the economy;
- It channels the financial resources and makes financial markets more deepened, competitive, efficient, and integrated.

The competitive financial markets have the following characteristics:

- It increases the investment-base of the financial institutions by allowing entry of more market players in the financial market;
- The rate of return is determined by the demand and supply rules;
- Competitive nature of the financial system help to establish the secondary markets for instruments;
- Turnover of instruments in primary and secondary markets should be significantly large; and
- Financial institutions should provide financial services at minimum spread.

In general, a market is said to be integrated when shocks arising in one market get quickly transmitted to other interrelated markets. Furthermore, integration is a process by which segmented markets become open and unified so the participants enjoy the unimpeded access, it can occur through the removal of domestic and international controls on trade in the assets, commodities and services under consideration (Jain and Bhanumurthy, 2005). Because of the financial integration, the rates of return on similar assets become equal internationally. The integration of financial market implies not only the increase in capital flows, but it also equalizes the price and returns of financial assets across countries. The economists have employed several approaches to measure the degree of financial market integration. However, various international parity conditions can frequently be used to measure the degree of financial integration. The first parity condition that focuses exclusively on the mobility of capital in facilitating arbitrage activities is the covered interest parity (CIP) condition. Under CIP, arbitrage activities are fully covered against exchange rate risk and the only barriers that prevent the free movements of capital across countries are the capital controls and other institutional impediments. As such the CIP is often viewed as the most unalloyed criterion for capital mobility (Frankel, 1992).

The second parity condition is the uncovered interest parity (UIP) condition. Under the UIP, investors seek to engage in the uncovered arbitrage activities in the hope of reaping larger speculative profits from future exchange rate movements. UIP condition holds only if the investors are risk neutral and they do not seek any exchange rate risk premium to undertake un-hedged arbitrage transactions. If the investors are risk averse and assets denominated in different currencies regarded as imperfect substitutes in their portfolio,

then a persistent deviation to UIP attributable to the exchange risk premium and exchange risk arise even if capital is freely mobile.

Given the definition of financial market integration in terms of the absence of barriers to capital mobility and risk neutral preference of the investors, the UIP condition would be a more appropriate benchmark for evaluating any departure from a situation of complete integration of financial markets. When UIP holds, it implies that not only capital is able to move freely in search to higher expected returns but also investor are willing to allocate their international portfolio without regards to the exchange rate risk. This study attempts to estimate the UIP because this approach is more straightforward than the alternative approaches.[2] UIP concentrates only on the linkage between interest rates on identical assets between home and abroad rather than on capital flows. Furthermore, this approach involves a notion of market efficiency, which suggests that the prices of financial assets adjust instantaneously to new information, even in the absence of international capital flows (Logue et al, 1976).

3. MODEL, METHODOLOGY AND DATA

The financial integration is examined by means of uncovered interest rate parity (UIP) condition. The UIP hypothesis postulates that if capital is perfectly mobile, investors would be indifferent between holding their portfolios in domestic or foreign securities because they obtain the same return from these assets. This hypothesis further postulates that in the presence of perfect capital mobility with no capital controls, transaction costs and risk premium, the expected rate of change of the spot exchange rate will be exactly equal to the nominal interest rate differential on perfectly comparable financial assets denominated in different currencies across countries. This condition can be stated as:

$$i_t - i_t^* = \Delta s^e_{t+1} + \xi_t \qquad (1)$$

Where $i(i^*)$ is the domestic (foreign) nominal interest rate, Δs^e_{t+1} is the expected rate of change of the spot exchange rate and ξ_t is the risk

[2] Alternatively, one can use capital flow and capital reflow approaches for testing financial market integration (For detail analysis see Logue et al, 1976). The former approach focuses upon the sensitivity of international capital flows to covered interest-rate differentials or uncovered interest-rate differentials (see, for example, Hodjera, 1973), the later concentrates not only domestic effects of international responses to domestic policy decisions, but also on the extent to which there is an independent foreign influence on domestic conditions that is not initially prompted by domestic policy (Herring and Marston, 1973, and Al-Loughani et al, 1996).

premium[3]. The presence of risk premium implies deviations from UIP. However, if the expected rate of depreciation (appreciation) of exchange rate and the risk premium are stationary i.e. $\Delta s^e_{t+1} \sim I(0)$ and $\xi_t \sim I(0)$, and if domestic as well as foreign interest rates are non-stationary but integrated of order one, i.e. $i_t \sim I(1)$ and $i_t^* \sim I(1)$, there will exist a long-run relationship between domestic and foreign interest rate if their linear combination is stationary. In order to examine the long-run relationship between domestic and foreign interest rate, equation (1) can be rewritten as:

$$i_t = \alpha + \beta i_t^* + v_t \qquad (2)$$

such that $(\alpha, \beta) = (0, 1)$[4], and $v_t = \Delta s^e_{t+1} + \xi_t$ is I (0). Equation (2) implies that domestic and foreign interest rates do not tend to drift too far in the long run whilst allowing for the short-run deviations.

In order to examine the integration of domestic and foreign interest rates, we apply Johansen and Juselius (1990) multivariate co-integration technique. The results of Johansen-Juselius co-integration test are sensitive to the lag length. The lag length is selected using the multivariate generalization of Akaike's Information Criterion (AIC). To this end, two likelihood ratio tests based on trace of the stochastic matrix (λ-trace) and maximal eigenvalue of the stochastic matrix (λ-max) are used. Once the co-integration between the variables is established, we can estimate the long-run co-integration relation. The long-run relation established through co-integration approach can then be used to estimate the short-run dynamics that captures the speed of adjustment between the variables.

The data sample which contains monthly observations from 1990 M1 to 2006 M3 on money market rate (call money rate) for India, Pakistan and Sri Lanka, and discount rate for Bangladesh, while USA's federal fund rate is taken as foreign interest rate. All the data samples were taken from IFS CD-ROM

4. EMPIRICAL RESULTS

Before the implementation of the Johansen-Juselius multivariate cointegration test, we need to determine the order of integration of the individual series. This can be done by using Augmented Dickey-Fuller (ADF) unit root test. The results of unit root test are reported in table1.

[3] As argued by McCallum (1994), the term ξ_t may represent time-varying aggregation and other effects, as well as risk premium

[4] If there is difference in taxes on interest income across countries then there is a possibility of measurement error and $\beta \neq 1$.

Table 1: Unit Root Test

Countries	ADF-Level	ADF-First Difference
Interest Rates		
India	-2.007 (14) C no T	-3.9795 (13)* C no T
Pakistan	-1.4447 (10) C	-7.7731 (9)* C
Sri Lanka	-1.6412 (3) no C and T	-10.2082 (2)* no C and T
Bangladesh	-1.4248 (0) C	-12.8800 (0)* C
United States	-2.7746 (3) C	-3.6833 (2)** C
Exchange Rates		
India	-3.4965 (0)* C	-12.6119 (0) ** C
Pakistan	-1.7078 (0) C and T	-13.1492 (0) * C and T
Sri Lanka	-0.5885 (8) C	-7.4961 (7)* C
Bangladesh	-1.4026 (9) C and T	-3.2287 (8)*** C and T

Note: Figures in brackets are the lags based on AIC and C and T are the constant and trend respectively. *, ** and *** are respectively significant at the 1%, 5% and 10% level of significance

The results of the unit root test indicate that the interest rates are I (1) in level and I (0) in first difference in all the cases, while the exchange rates are also I (1) in level and I (0) in their first difference in all the cases except for India. In the case of India, the exchange rate is stationary in level i.e. I (0). These results of the unit root test satisfying the necessary condition for the implementation of the Johansen-Juselius multivariate co-integration approach.

To implement the multivariate co-integration test, the optimal lags are selected on the basis of AIC are 6, 3, 4, and 3 for India, Pakistan, Sri Lanka and Bangladesh respectively. On the basis of Johansen-Juselius co-integration test, using the United States as reference country, reported in tables 2 and 3, based on the max and trace statistics, we cannot reject the hypothesis of no co-integration between domestic interest rates and foreign interest rate.

Furthermore, the results of co-integration test and coefficient restriction test are highly consistent and lending strong support for the validity of the UIP in all cases. The coefficient restrictions implied by UIP ($\alpha = 0$ and $\beta = 1$) are not rejected except for India in which case the restriction imposed on the slope coefficient is rejected. The adjustment coefficient (error-correction) bears expected negative signs and are highly significant in all cases, lending

further support for co-integration. However, the speed of adjustment in the case of India and Bangladesh is very slow as compared to other cases. The results further suggest that there is no possibility of two-way causality. Only foreign interest rate causes domestic interest rates and domestic interest rate does not cause foreign interest rate as indicated by the significance of the adjustment coefficients. Recursive estimation of the long-run parameters for each country (figures 1-4) indicates that the estimated parameters lie well inside the standard error bands. However, the estimated parameters remain more stable for India and Sri Lanka while showing some movements overtime for Pakistan and Bangladesh, but do not violate the constancy property. This may be due to the fact that the liberalization efforts in India and Sri Lanka are more significant than Pakistan and Bangladesh.

Table 3: Normalized Long-run Co-integration Coefficients and Coefficient Restrictions Test

$$i_t = \alpha + \beta\, i_t^* + v_t$$

	India	Pakistan	Sri Lanka	Bangladesh
Long-run Coefficient (Beta)				
α	0.29 (2.95)	2.29 (1.48)	6.50 (4.27)	2.85 (0.72)**
β	2.20 (0.64)	1.43 (0.32)**	3.00 (0.92)**	0.83 (0.15)**
$\chi^2(\alpha = 0)$	0.005	1.48	1.34	2.77
$\chi^2(\beta = 1)$	6.39**	1.44	2.99	0.02
Adjustment Coefficient (Alpha)				
Δi_t	-0.04 (0.01)**	-0.31 (0.07)**	-0.32 (0.07)**	-0.05 (0.01)**
Δi_t^*	0.003 (0.003)	0.008 (0.004)	0.0006 (0.001)	0.006 (0.009)

Note: *, ** indicates significant at the 5% level of significance. Figures in brackets indicate standard errors.

Table 2: Johansen- Juselius Co-integration Test Results. (CMRIN, CMRPK, CMRSRI, DRB vis-à-vis FFR)[c]

Country	Trace Test				Maximum Eigenvalue Test			
	Null Hypothesis	Alternative Hypothesis	Test Statistic	95% Critical Values	Null Hypothesis	Alternative Hypothesis	Test Statistic	95% Critical Values
India	$r = 0$	$r >= 1$	22.10**	20.26	$r = 0$	$r = 1$	15.82***	15.89
	$r <= 1$	$r = 2$	6.28	9.16	$r <= 1$	$r = 2$	6.28	9.16
Pakistan	$r = 0$	$r >= 1$	27.26**	20.26	$r = 0$	$r = 1$	21.23**	15.89
	$r <= 1$	$r = 2$	5.16	9.16	$r <= 1$	$r = 2$	6.01	9.16
Sri Lanka	$r = 0$	$r >= 1$	29.38**	20.26	$r = 0$	$r = 1$	21.78**	15.89
	$r <= 1$	$r = 2$	7.60	9.16	$r <= 1$	$r = 2$	7.60	9.16
Banglade-sh	$r = 0$	$r >= 1$	28.32**	20.26	$r = 0$	$r = 1$	20.17**	15.89
	$r <= 1$	$r = 2$	8.15	9.16	$r <= 1$	$r = 2$	8.15	9.16

** and *** Indicate significant at the 5% and 10% level. Co-integration test includes restricted constant and no deterministic trend.

[c]CMRPK, CMRIND, CMRSRI, DRB are respectively call money rate for Pakistan, India and Sri Lanka respectively. While DRB discount rate for Bangladesh.

Figure 1: Recursive Estimation of the Long-run Coefficient for India

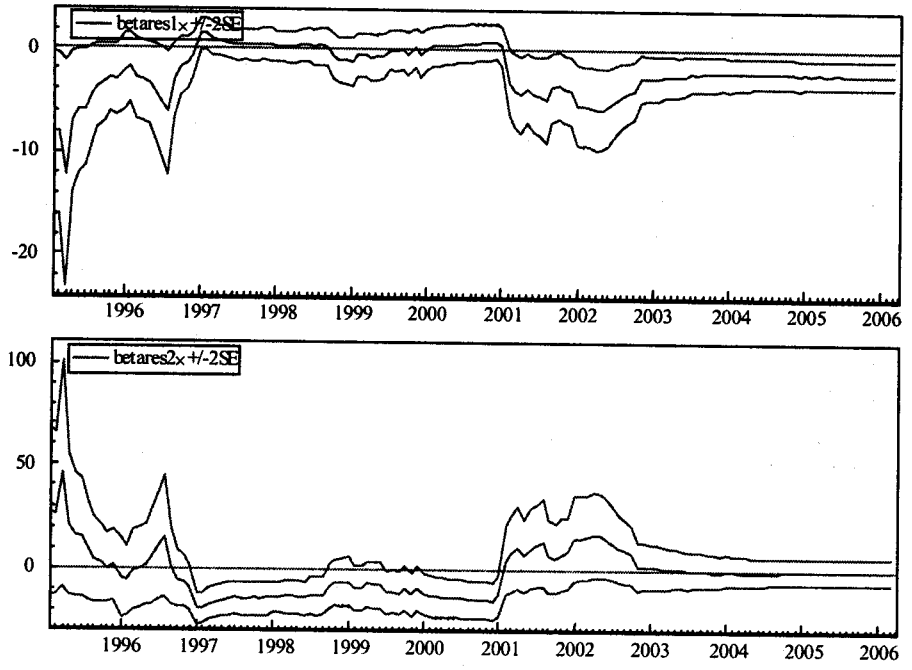


Figure 2: Recursive Estimation of the Long-run Coefficients for Pakistan

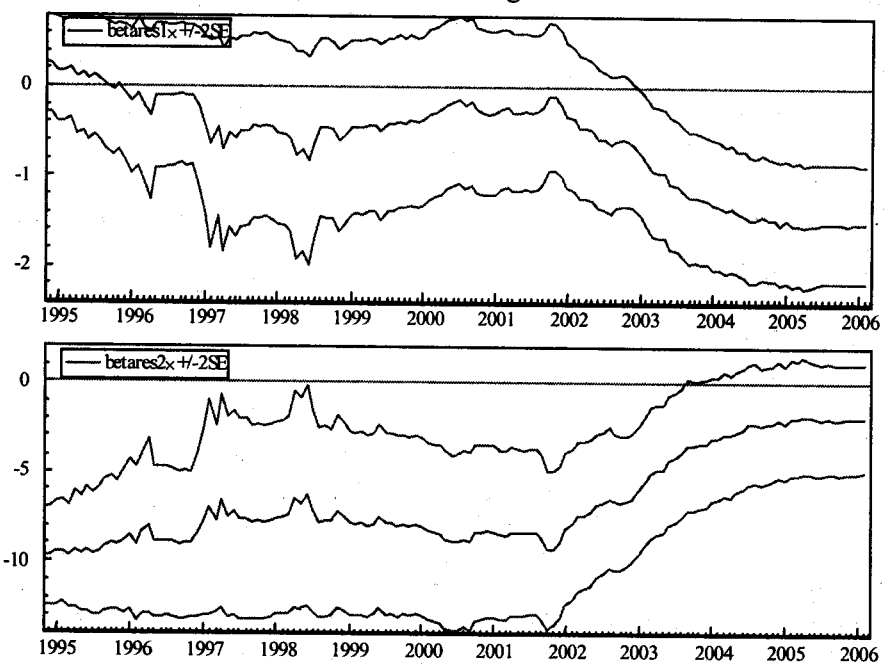
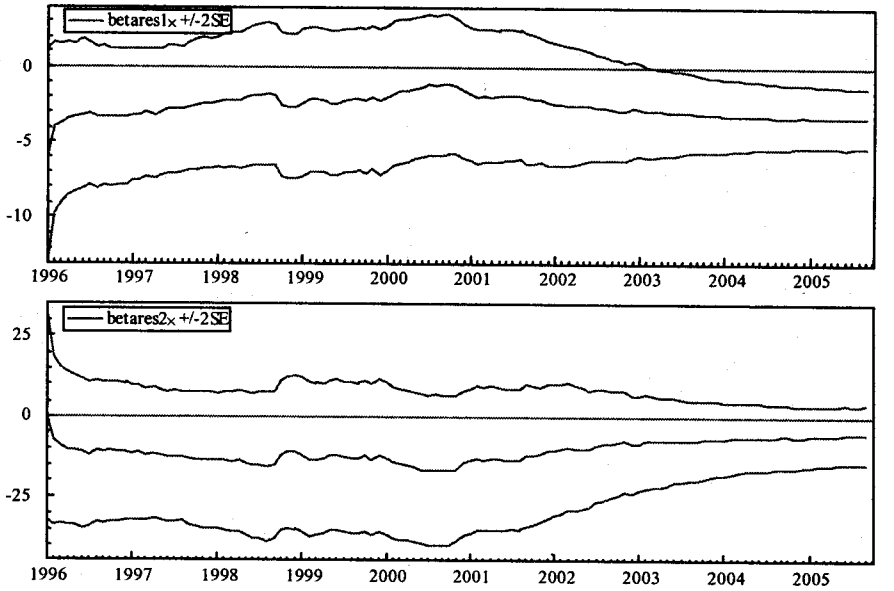


Figure 3: Recursive Estimation of the Long-run Coefficients for Sri Lanka



The results further suggest that domestic money markets are strongly integrated with the international financial markets. This may be due to the financial market reforms that are initiated in the money markets since 1990.

To examine the interest rate linkages within these SAARC countries, we again implemented Johansen-Juselius (1990) cointegration technique between Pak-interest rate vis-à-vis India, Sri Lanka and Bangladesh interest rates. Table 4 reports the cointegration results. Both trace and maximum eigenvalue tests indicate the existence of one significant cointegrating vector at 5% level. Although, this result indicates a significant cointegration among the Pakistan's interest rate vis-à-vis India, Sri Lanka and Bangladesh's interest rate, but the degree of integration remained low because of the immaturity and diversity of the financial markets in the region. Based on single cointegrating vector, the normalized long-run coefficients with coefficient restrictions and presented in table 5.

The estimated coefficients indicate that in the long-run, Indian interest rate is negatively related to Pak-interest rate, while Sri Lankan and Bangladeshi interest rates are positively related to Pak- interest rate (table 5 panel A). The coefficient restrictions test (table 5 panel B) suggests that all the long-run coefficients are statistically different from zero. The recursive estimates of the long-run coefficients are presented in figure 4. The recursive estimates of the long-run coefficients indicate a high degree of movements of the coefficients, but remain within the band and do not violate the parameter constancy property.

Table 4: Johansen-Juselius Cointegration Results

Sample = 1990M1-2005M9, Lag = 3

Series		Trace Test				Maximum Eigenvalue Test			
		Null Hypothesis	Alternative Hypothesis	Test Statistic	95% Critical Values	Null Hypothesis	Alternative Hypothesis	Test Statistic	95% Critical Values
CMRPK CMRIND, and DRB	vis-à-vis CMRSRI	$r = 0$	$r >= 1$	75.75**	54.07	$r = 0$	$r = 1$	45.52**	28.59
		$r <= 1$	$r >= 2$	30.24	35.19	$r <= 1$	$r = 2$	19.01	22.30
		$r <= 2$	$r >= 3$	11.23	20.26	$r <= 2$	$r = 3$	7.02	15.89
		$r <= 3$	$r = 4$	4.21	9.16	$r <= 3$	$r = 4$	4.21	9.16

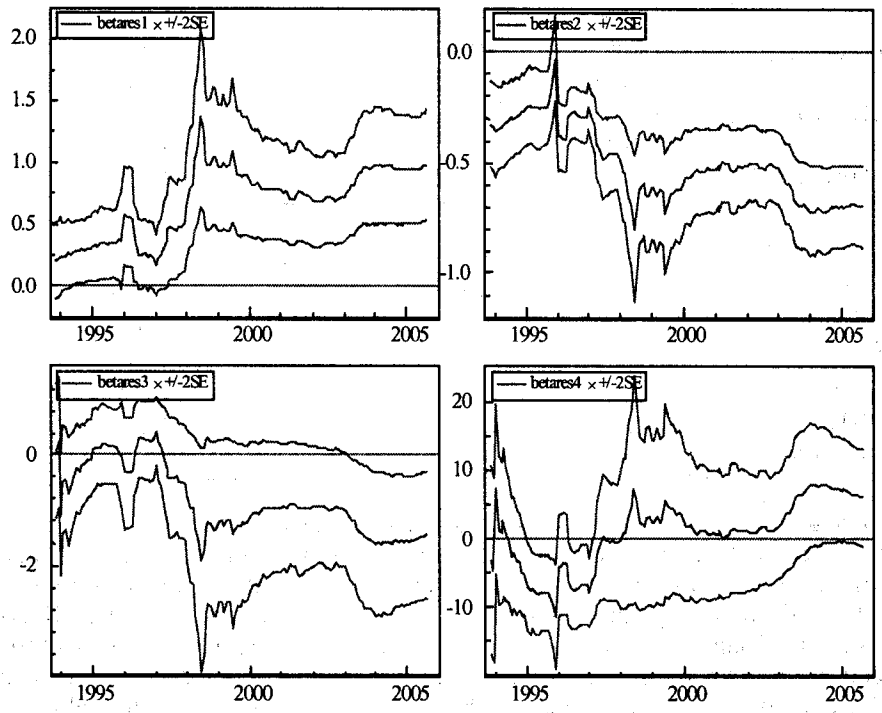
** Indicate significant at the 5% level. Co-integration test includes restricted constant and no deterministic trend. 2 lags were selected based on likelihood ratio test adjusted for degrees of freedom and AIC. CMRPK, CMRIND, CMRSRI, DRB are respectively call money rate for Pakistan, India and Sri Lanka respectively. While DRB discount rate for Bangladesh.

Table 5: Normalized Co-integrating Vector

Co-integrating Vector	Panel A: Long-run Normalized Coefficients of Interest rates				
	CMRPK	CMRIND	CMRSRI	DRB	Intercept
1	1	-0.98 (0.22)*	0.70 (0.09)*	1.45 (0.57)**	5.94 (3.52)
Panel B: Coefficient Restrictions on the Cointegrating Vector					
Null Hypothesis			Test Statistic ($\chi^2(1)$)		
A1=0			9.73*		
a2=0			13.55*		
a3=0			26.50*		
a4=0			5.69**		

Note: *, ** indicate significant at the 1% and 5% level of significant. Numbers in brackets indicates t-values. (a1, a2, a3, a4) represents the coefficient of the cointegrating vectors associates with Pakistan, India, Sri Lanka and Bangladesh respectively. χ^2 is chi-squared distribution with degrees of freedom 1 for all cases.

Figure 4: Recursive Estimates of the Long-Run Coefficients in the SAARC Region



More information regarding the link between the variables of the system can be obtained from the short-run error-correction estimates. The results of the vector error-correction model (VECM) are reported in table 6.

Table 6: Parameters of the Vector Error-Correction Model

Interest Rates	Δ CMRPK	Δ CMRIND	Δ CMRSRI	Δ DRBANG
Δ CMRPK[-1]	-0.41	0.01	-0.82	-0.003
	(-5.00)*	(0.69)	(-3.89)*	(-0.541)
Δ CMRPK[-2]	-0.32	0.02	-0.46	0.005
	(-3.92)*	(1.58)	(-2.16)**	(0.990)
Δ CMRPK[-3]	-0.04	0.007	-0.21	0.001
	(-0.55)	(0.506)	(-1.05)	(0.237)
Δ CMRIND[-1]	-0.37	0.20	-0.08	0.04
	(-0.97)	(2.73)**	(-0.08)	(1.56)
Δ CMRIND[-2]	0.42	0.19	0.99	0.001
	(1.09)	(2.54)*	(0.99)	(0.028)
Δ CMRIND[-3]	0.07	0.15	-0.61	0.007
	(0.17)	(2.08)**	(-0.62)	(0.299)
Δ CMRSRI[-1]	-0.05	-0.004	0.02	-0.001
	(-1.20)	(-0.537)	(0.21)	(-0.452)
Δ CMRSRI[-2]	-0.02	-0.004	0.07	0.002
	(-0.58)	(-0.642)	(0.75)	(0.957)
Δ CMRSRI[-3]	-0.009	-0.006	0.04	0.003
	(-0.286)	(-0.923)	(0.449)	(0.193)
Δ DRBANG[-1]	-1.33	-0.18	-1.35	0.07
	(1.12)	(-0.81)	(-0.44)	(0.96)
Δ DRBANG[-2]	1.69	-0.18	5.86	0.07
	(1.41)	(-0.77)	(1.89)**	(0.90)
Δ DRBANG[-3]	-0.22	-0.02	0.19	0.05
	(-0.19)	(-0.08)	(0.06)	(0.66)
ECM[-1]	-0.11	-0.05	0.52	-0.00
	(-2.23)**	(-5.02)*	(4.10)*	(-0.26)
R^2	0.26	0.38	0.21	0.06
Adj. R^2	0.21	0.33	0.16	-0.00
F-stat	5.10	8.55	3.84	0.99

* and ** indicate significant at the 1% and 5% level respectively. Δ is the first difference, ECM is the error-correction term while numbers in [.] and (.) represents respectively number of lags and t-values.

It appears from the results that interest rates for all the countries are closely related to each other. The short-run movements of Indian, Sri Lankan and Bangladeshi interest rate do not significantly affect the Pakistan's money market. While except India and Bangladesh, Pakistan's interest rate affects Sri Lankan financial markets. The error-correction terms, which represent the speed of adjustment, are statistically significant only in the case of Pakistan India and Sri Lanka. This means that the interest rate related to Pakistan, India and Sri Lanka act as equilibrating factors in the system, while Bangladesh rates do not respond to the past disequilibrium. The results favour the absence of the short-run causality between the interest rates with in this SAARC region.

5. CONCLUSION

This study uses uncovered interest rate parity condition to measure the degree of financial integration between major SAARC countries and vis-à-vis US interest rate over the period 1990M1-2006M2. The results suggest the existence of strong cointegration in all the cases. The coefficient restrictions are fully satisfied for almost all the cases except for India. In the case of India the restriction related to slope term is not satisfied. This may be due to the measurement errors or because of the recent financial sector reforms. The results further suggest that the causality run from federal fund rate to those of the other countries as indicated by the significance of the adjustment coefficient. The results of this study confirm the validity of UIP and revealed a significant degree of financial markets integration.

Furthermore, the study also examines the interest rate co-movements within this SAARC region. We have tested Pakistan's interest rate vis-à-vis India, Sri Lanka and Bangladesh's interest rates. From the Johansen-Juselius cointegration test, we found that in the long-run the interest rates in these countries are closely related. Moreover, we found only one cointegrating vector, which indicate a low degree of financial markets integration among these countries. The short-run error-correction terms indicate that only Pakistan, India and Sri Lanka play the role of equilibrating factor towards the long-run equilibrium and there is no evidence of short-run dynamic interaction between Pakistan and Bangladesh rates.

Based on the above results we concluded that the interest rates within this SAARC countries are closely related in the long-run. However, in the short-run only Pakistani, Indian and Sri Lanka rates play a significant role. These features should have strong implications to the interest rate linkages and efficient financial markets integration in the SAARC region.

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